WHAT IS CLAIMED IS:

1. A method for loading a disaccharide into mammalian nucleated cells, comprising:

contacting said cells for at least 2 hours with a solution comprising at least one disaccharide, thereby loading the cells with disaccharide to produce disaccharide-loaded mammalian nucleated cells.

2. A method of claim 1, wherein said cells are selected from the group consisting of stem cells, immune system cells, and epithelial cells.

3. A method of claim 1, wherein said contacting is for 10 hours.

4. A method of claim 1, wherein said contacting is for 24 hours.

5. A method of claim 1, wherein said disaccharide is trehalose.

6. A method of claim 1, wherein said solution further comprises not more than 3% dimethyl sulfoxide.

7. A method for increasing survival of mammalian nucleated cells following drying and rehydration, comprising:

(a) contacting said cells with a solution comprising at least one disaccharide for at least 2 hours, thereby producing disaccharide-loaded cells,

(b) drying said disaccharide-loaded cells to a residual water content between 0.2 and 0.5 gram water per gram of dry weight, and

(c) rehydrating said cells,

thereby increasing survival of the cells.

8. A method of claim 7, wherein said contacting is for 24 hours.

9. A method of claim 7, wherein said cells are selected from the group consisting of stem cells, immune system cells, and epithelial cells.

10. A method of claim 7, wherein said disaccharide is trehalose.

11. A method of claim 7, wherein said cells further comprise a heat shock protein.

12. A method of claim 11, wherein said heat shock protein is induced by exposing said cells to a heat shock.

13. A method of claim 12, wherein said heat shock consists of raising the temperature of medium contacting the cells to 42 - 44 °C for one hour, and then allowing the temperature of the medium to drop to 36- 38 °C.

14. A method of claim 11, wherein said heat shock protein is introduced into the cells by contacting said cells with a solution comprising said protein.

15. A method of claim 11, wherein said heat shock protein is expressed from a nucleic acid sequence introduced into said cells.

16. A method of claim 11, wherein said heat shock protein is p26 from *Artemia franciscana*.

17. A method of claim 7, further wherein said cells are contacted with a solution comprising an apoptosis inhibitor.

18. A method of claim 17, wherein said apoptosis inhibitor is selected from the group consisting of N-(2-Quinolyl)valyl-aspartyl-(2,6-difluorophenoxy)methyl ketone (in which the aspartyl residue is o-methylated or non-o-methylated), caspase I inhibitor II, calpain inhibitor, and Bcl-xL.

19. A method of claim 7, further wherein said cells are contacted by a solution comprising arbutin or hydroquinone, provided that said cells are not 293 cells or B cells.

20. A method of claim 7, further wherein said cells are contacted by a solution comprising not more than 3% dimethyl sulfoxide.

21. A method of claim 7, further wherein said cells are contacted by a solution comprising a heat shock protein and an apoptosis inhibitor.

22. A method of claim 21, wherein said solution further comprises not more than 3% dimethyl sulfoxide.

23. A method of claim 19, wherein said cells are dried in a medium comprising arbutin or hydroquinone.

24. A method of claim 7, wherein said cells are dried in rounded droplets of drying buffer.

25. A method for increasing survival of mammalian nucleated cells following drying and rehydration, comprising:

(a) contacting said cells with a solution comprising an apoptosis inhibitor, thereby loading the cells with said apoptosis inhibitor, to produce apoptosis inhibitor -loaded cells,

(b) drying said apoptosis inhibitor-loaded cells, and

(c) rehydrating said cells,

thereby increasing survival of the cells.

26. A method of claim 25, wherein said apoptosis inhibitor is selected from the group consisting of N-(2-Quinolyl)valyl-aspartyl-(2,6-difluorophenoxy)methyl ketone (in which the aspartyl residue is o-methylated or non-o-methylated), Caspase I inhibitor II, Calpain inhibitor, and Bcl-xL.

27. A method of claim 25, wherein said cells are selected from the group consisting of stem cells, immune system cells, and epithelial cells

28. A method of claim 25, wherein said cells are dried in droplets of drying buffer.

29. A method for increasing survival of mammalian nucleated cells following drying and rehydration, comprising:

(a) introducing a heat shock protein into, or inducing production of a heat shock protein in, said cells, to produce heat shock protein-loaded cells,

(b) drying said heat shock protein-loaded cells; and

(c) rehydrating said cells,

thereby increasing survival of the cells.

30. A method of claim 29, wherein said heat shock protein is p26 from *Artemia franciscana.*

31. A method of claim 29, wherein said heat shock protein is introduced into said cells by incubating said cells in a medium comprising said heat shock protein.

32. A method of claim 29, wherein said heat shock protein is induced in said cells by raising the temperature of medium contacting the cells to 42 - 44 °C for one hour, and then allowing the temperature of the medium to lower to 36- 38 °C.

33. A method of claim 29, wherein said heat shock protein is introduced into said cells by introducing into said cells a nucleic acid sequence comprising a promoter operably linked to a sequence encoding said heat shock protein.

34. A method of claim 29, wherein said cells are selected from the group consisting of stem cells, immune system cells, and epithelial cells.

35. A method of claim 29, wherein said cells are dried in droplets of drying buffer.

36. A method for increasing survival of mammalian nucleated cells following drying and rehydration, provided said cells are not 293 cells or B cells, comprising:

(a) incubating said cells with a compound selected from arbutin and hydroquinone, to produce arbutin- or hydroquinone- loaded cells,

(b) drying said arbutin- or hydroquinone- loaded cells, and

(c) rehydrating said cells,

thereby increasing survival of the cells.

37. A method of claim 36, wherein said compound of step (a) is arbutin.

38. An isolated mammalian nucleated cell comprising a disaccharide and a compound selected from the group consisting of arbutin and hydroquinone.

39. An isolated mammalian nucleated cell of claim 38, wherein said compound is arbutin.

40. A mammalian nucleated cell of claim 38, wherein said cell is dried.

41. A mammalian nucleated cell of claim 38, further comprising an apoptosis inhibitor.

42. A mammalian nucleated cell of claim 38, further comprising a heat shock protein.

43. A mammalian nucleated cell of claim 38, wherein said disaccharide is trehalose.

44. An isolated dried mammalian nucleated cell comprising a disaccharide and an exogenous heat shock protein.

45. A dried mammalian nucleated cell of claim 44, wherein said disaccharide is trehalose.

46. A isolated, dried mammalian nucleated cell comprising a disaccharide and an exogenous apoptosis inhibitor.

47. A dried mammalian nucleated cell of claim 46, wherein said disaccharide is trehalose.